Worksheet B: Standard Application Process

Calculating Removal from Off-site Drainage Areas

Step 1:	Project Description

A.   Calculate Percent Imperviousness

1)   Off-site Drainage Area to be Treated by On-site BMP, $A_{off-site}$ = _____ acres

2)   Ultimate Off-site Drainage Area Imperviousness

    (a)   Ultimate Off-site Impervious Area (acres)

Roads	_____ (acres)
Parking Lots	_____ (acres)
Driveways	_____ (acres)
Sidewalks/paths	_____ (acres)
Rooftops	_____ (acres)
Decks	_____ (acres)
Swimming pools/ponds	_____ (acres)
Other	_____ (acres)

        Total Off-site Impervious Area (sum of the above) = _____ (acres)

    (b)   Ultimate Off-site Imperviousness ($I_{off-site}$)

Off-site Imperviousness ($I_{off-site}$) =   Total Off-site Impervious Area / $A_{off-site}$

                =   (Step 2a) / (Step 1)

                =   (_____) / (_____)

                =   _____ %

B.   Define Development Category of Off-site Drainage Area

1)   New Development: Ultimate imperviousness of off-site drainage area less than 15% I *(Go to Step 2A)*

2)   Redevelopment: Ultimate imperviousness of off-site drainage area greater than or equal to 15% I *(Go to Step 2B)*

Step 2: Calculate Post-Development Load for Off-site Drainage Area ($L_{off-site}$)

A.   New Development

$L_{off-site}$ = $0.5 (A_{off-site})$

= $0.5 ($_____$)$

=   _____ lbs/year of total phosphorus

Where:

$L_{off-site}$ =   Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

0.5   =   Annual total phosphorus load from undeveloped lands (lbs/acre/year)

$A_{off-site}$ =   Off-site drainage area to be treated by on-site BMP (acres)

B.   Redevelopment

$L_{off-site}$ = $(R_v) (C) (A_{off-site})\ 8.16$

R_v = $0.05 + 0.009 (I_{off-site})$

= $0.05 + 0.009 ($_____$) = $ _____

$L_{off-site}$ = $($_____$) ($_____$) ($_____$)\ 8.16$

=   _____ lbs/year of total phosphorus

Where:

$L_{off-site}$ =   Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

R_v =   Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff

$I_{off-site}$ =   Ultimate off-site imperviousness (i.e. I = 75 if site is 75% impervious)

C   =   Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l

$A_{off-site}$ =   Off-site drainage area to be treated by on-site BMP (acres)

8.16   =   Includes regional constants and unit conversion factors

Step 3: **Calculate the Load Removed from Off-site Drainage Areas by On-site BMP**

Type of BMP: _____

Off-site Load Removed = $(BMP_{RE})(L_{off\text{-}site})$

= (_____) (_____)

= _____ lbs/year of total phosphorus

Where:
BMP_{RE} = BMP removal efficiency for total phosphorus, see Table 4.8 (%)
$L_{off\text{-}site}$ = Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

Step 4: **Calculate the Total Load Removed by On-site and Off-site BMPs**

Total Load Removed = Load Removed On-site + Load Removed Off-site

= (Worksheet A, Step 5) + (Step 3)

= (_____) + (_____)

= _____ lbs/year of total phosphorus

Pollutant Removal Requirement (Worksheet A, Step 4) = _____ lbs/year

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule.

Has the Pollutant Removal Requirement been met? ☐ **Yes** ☐ **No**